



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,511	02/25/2002	Szeming Cheng	9432-000170	2978

27572 7590 07/28/2005

HARNESSE, DICKEY & PIERCE, P.L.C.  
P.O. BOX 828  
BLOOMFIELD HILLS, MI 48303

EXAMINER
----------

HENNING, MATTHEW T

ART UNIT	PAPER NUMBER
----------	--------------

2131

DATE MAILED: 07/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/082,511

Applicant(s)

CHENG ET AL.

Examiner

Matthew T. Henning

Art Unit

2131

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2/25/2003.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

Art Unit: 2131

This action is in response to the communication filed on 2/25/2002.

### **DETAILED ACTION**

Claims 1-19 have been examined.

#### ***Title***

The title of the invention is acceptable.

#### ***Priority***

This application has no priority claimed.

Therefore, the effective filing date for the subject matter defined in the pending claims in this application is 2/25/2002.

#### ***Information Disclosure Statement***

The information disclosure statement(s) (IDS) submitted on 2/25/2003 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the examiner is considering the information disclosure statements.

The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered. This pertains mainly to the "Audio Watermarking of MPEG-2 AAC Bit Streams" reference of page 1.

Art Unit: 2131

*Drawings*

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, **the reduction of variance of claims 5-6** must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Art Unit: 2131

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

*A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.*

Claims 1-4, 7-14, and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Florencio et al. (US Patent Number 6,621,866) hereinafter referred to as Florencio, and further in view of Chen et al. ("Quantization Index Modulation: A Class of Provably Good Methods for Digital Watermarking and Information Embedding") hereinafter referred to as Chen.

Regarding claims 1, 8, 10, and 18, Florencio disclosed an encoding apparatus for embedding data in a compressed data stream, the apparatus comprising: a partial decoder receptive of the compressed data stream and operable to partially decode the compressed data stream, thereby obtaining a partially decoded data stream having quantization indices (See Florencio Col. 4 Lines 34-54); a data embedder in communication with said partial decoder and receptive of the data and the partially decoded data stream, said data embedder operable to embed the data, thereby obtaining a data-embedded partially decoded data stream (See Florencio Col. 4 Lines 51-60); and a partial encoder in communication with said data embedder, said partial encoder operable to partially encode the data-embedded partially decoded data stream, thereby obtaining a data-embedded compressed data stream (See Florencio Col. 4 Lines 51-65),

Art Unit: 2131

1 however, Florencio failed to disclose embedding the data in the quantization indices or that the  
2 data being marked was audio data, and further failed to disclose partially decoding the  
3 compressed data stream to obtain the quantization indices or a correlation detector to extract the  
4 data from the indices.

5 Chen teaches a method for embedding data via quantization index modulation and further  
6 teaches that this method for embedding data is provably good against arbitrary bounded and fully  
7 informed attacks, and provably better rate distortion-robustness tradeoffs than spread spectrum  
8 and low-bit modulation methods (See Chen Abstract). Chen further teaches the use of a  
9 correlation detector in order to decode the watermark (See Chen Page 1437 Lines 12-40 and  
10 footnote 20). Chen further teaches that data can be embedded in the quantization indices of  
11 audio data in order to protect the audio data (See Chen Page 1423 Col. 2 Lines 4-6).

12 It would have been obvious to the ordinary person skilled in the art at the time of  
13 invention to employ the teachings of Chen in the watermarking system of Florencio by only  
14 decoding the MPEG data to get the quantization indices and embedding the data into the  
15 quantization indices and to use a correlation detector in order to extract the watermark and to do  
16 so for audio data as well as video data. This would have been obvious because the ordinary  
17 person skilled in the art at the time of invention would have been motivated to protect embedded  
18 copyright data in audio or video from arbitrary bounded attacks and fully informed attacks.

19 Regarding claims 2 and 11, the combination of Florencio and Chen disclosed an index  
20 selector in communication with said partial decoder, said index selector operable to select a  
21 plurality of the quantization indices, thereby obtaining selected indices (See Chen Page 1426  
22 Col. 2 Lines 12-16), and to determine respective amounts by which to modify the selected

Art Unit: 2131

1 indices (See Chen Page 1426 Col. 2 Lines 17-32), wherein said data embedder is operable to  
2 embed the data into the quantization indices by modifying the selected indices according to the  
3 respective amounts, thereby obtaining a data-embedded partially decoded data stream (See Chen  
4 Page 1426 Lines 12-16).

5 Regarding claims 3, 12, and 13, the combination of Florencio and Chen disclosed that the  
6 index selector is operable to choose indices corresponding to ranges within a sensitive portion of  
7 a human sensory range (See Florencio Col. 2 Lines 5-7), discard zero indices and always  
8 determine a minimum amount (See Chen Page 1439 Col. 1 Paragraph 1).

9 Regarding claims 4, 9, 14, and 19, the combination of Florencio and Chen disclosed the  
10 use of a encoding/decoding key (See Chen Page 1432 Paragraph 1 Codeword).

11 Regarding claims 7 and 17, the combination of Florencio and Chen disclosed that the  
12 partial encoding and decoding operate via the same codebooks (See Chen Page 1432 Col. 1  
13 Lines 1-14).

14 Claims 5-6 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the  
15 combination of Florencio and Chen as applied to claims 1 and 10 above, and further in view of  
16 Sprague (US Patent Number 4,617,645).

17 Florencio and Chen disclosed that the audio data stream had variance (See Chen Page  
18 1427 Col. 1 Equation 17 and following paragraph), but failed to disclose reducing the variance.

19 Sprague teaches a method for compressing audio data involving sorting the data in  
20 descending order (See Sprague Claim 6), and then constructing a new set of data by taking the  
21 difference between pairs of consecutive samples resulting in an alternating signed data (See  
22 Sprague Col. 3 Lines 7-19).

It would have been obvious to the ordinary person skilled in the art at the time of invention to employ the teachings of Sprague in the audio watermarking system of Florencio and Chen by utilizing the compression system of Sprague for compressing the quantization indices. This would have been obvious because the ordinary person skilled in the art at the time of invention would have been motivated to considerably compact the quantization indices. Further, in this combination, the variance would be reduced as a result of taking the difference of between pairs of consecutive samples.

## Conclusion

Claims 1-19 have been rejected.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Brunk et al. (US Patent Number 6,483,927) disclosed a system for hiding data in quantization data of an audio signal.

b. Bolle et al. (US Patent Number 6,301,368) disclosed a system for reading data hidden in compressed images by decoding the image to get quantization indices and further reading the hidden data.

c. Chen et al. (US Patent Number 6,233,347) disclosed a system for embedding data in the quantization indices of a host signal.

d. Chen et al. (“Quantization Index Modulation Methods for Digital Watermarking and Information Embedding of Multimedia”) disclosed a method for hiding data in quantization indices.



Art Unit: 2131

1 e. Xu (Patent Application Publication 2004/0059918) disclosed a system that  
2 embedded data in a compressed image and decompressed the image prior to embedding the data.

3 Any inquiry concerning this communication or earlier communications from the  
4 examiner should be directed to Matthew T. Henning whose telephone number is (571) 272-3790.

5 The examiner can normally be reached on M-F 8-4.

6 If attempts to reach the examiner by telephone are unsuccessful, the examiner's  
7 supervisor, Ayaz Sheikh can be reached on (571) 272-3795. The fax phone number for the  
8 organization where this application or proceeding is assigned is 703-872-9306.

9 Information regarding the status of an application may be obtained from the Patent  
10 Application Information Retrieval (PAIR) system. Status information for published applications  
11 may be obtained from either Private PAIR or Public PAIR. Status information for unpublished  
12 applications is available through Private PAIR only. For more information about the PAIR  
13 system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR  
14 system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

15  
16  
17 Matthew Henning  
18 Assistant Examiner  
19 Art Unit 2131  
20 7/21/2005

